Format No: CP/TF/01

TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	CP-2018-12-27-128 **Date: 16-11-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balaji Layout near Shobha Apartment near Railway Bridge in Ward no. 6, Byatarayanapura sub Division
Agency	:	V. Chandrappa, No.681, Dasarahalli, Bangalore - 24
Customer's Reference	:	BBMP/EE/BTP/WO/26/2016-17
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	13-11-18
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification , IS 4031 (Part 1,2 3,4,5, 6,11):1988 IS 4031 Part 1 DETERMINATION OF FINENESS BY DRY SIEVING, Clause 4.4 IS 4031 Part 2, Determination of Fineness by Blaine Air Permeability Method, Clause 5 IS 4031 Part 3, Determination of Soundness, Clause 5,Clause 6 IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 5, Determination of Initial & Final Setting Time, Clause 5 IS 4031 Part 11,DETERMINATION OF DENSITY , Clause 6
Date of test	:	13-11-18
Environmental Conditions during test	:	Temperature: 26°C Humidity: 72%

Sl.No.	Physical properties	Results	Requirement as per IS 12269: 2013
1	Fineness by dry sieving (%)	2.13	–
2	Finess by Air permeablity method (m^2/kg,Min)	288.7	225m^2/kg, Min
3	Density (gm/cc)	3.15	–
4	Standard Consistency (%)	28.5%	Not specified
5	Initial Setting time	185 minutes	Not less than 30 minutes
6	Final Setting time	290 minutes	Not more than 600 minutes
7	Soundness (Le Chatelier's Method)	1.5mm	Not more than 10 mm

Note:

The results pertain to the samples received and tested.

All information furnished by Customer/Representative

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TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	**CP-2018-12-27-128** **Date: 20-11-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balaji Layout near Shobha Apartment near Railway Bridge in Ward no. 6, Byatarayanapura sub Division
Agency	:	V. Chandrappa, No.681, Dasarahalli, Bangalore - 24
Customer's Reference	:	BBMP/EE/BTP/WO/26/2016-17
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	13-11-18
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification , IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 6, Determination of Compressive Strength, Clause 6
Date of test	:	13-11-18
Environmental Conditions during test	:	Temperature: 26°C Humidity: 72%

Compressive Strength

Sl.No.	Physical properties	Results	Requirement as per IS 12269: 2013
1	3 Days	29.0N/mm^2	Not less than 27 N/mm^2
2	7 Days	38.5N/mm^2	Not less than 37 N/mm^2

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Quality Manager

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TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2018-12-27-128** **Date: 16-11-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balaji Layout near Shobha Apartment near Railway Bridge in Ward no. 6, Byatarayanapura sub
Agency	:	V. Chandrappa, No.681, Dasarahalli, Bangalore - 24
Customer's Reference	:	BBMP/EE/BTP/WO/26/2016-17
Source of Sample	:	Sample supplied by Agency
Sample condition	:	Satisfactory
Date of Receipt	:	13-11-18
Sample Type	:	40mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates)
		IS: 2386 :1963(Part - 1,3,4) RA2011
		IS 2386 Part 1: Particle Size and Shape
		IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption
		IS 2386 Part 4: Mechanical Properties
Date of test	:	13-11-18

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 40MM DOWN COARSE AGGREGATE:

Total weight taken : 15000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	80 mm	0	0	0.0	100	100
2	40 mm	234	234	1.6	98.4	90-100
3	20 mm	5480	5714	38.1	61.9	30-70
4	10 mm	4676	10390	69.3	30.7	10-35
5	4.75 mm	4256	14646	97.6	2.4	0-5
6	Pan	354	15000	100.0	0	---

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2018-12-27-128** **Date: 16-11-18**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	11.2	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	10.8	
3	Specific Gravity	2.68	–
4	Bulk Density(Loose) (Kg/l)	1.5	–
5	Bulk Density(Compacted) (Kg/l)	1.53	–
6	Water Absorption(%)	0.23	–

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Quality Manager

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Format No: CP/TF/01

TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2018-12-27-128** **Date: 16-11-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balaji Layout near Shobha Apartment near Railway Bridge in Ward no. 6, Byatarayanapura sub Division
Agency	:	V. Chandrappa, No.681, Dasarahalli, Bangalore - 24
Customer Reference	:	BBMP/EE/BTP/WO/26/2016-17
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	13-11-18
Sample Type/ Size	:	20mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates) IS: 2386 :1963(Part - 1,3,4) RA2011 IS 2386 Part 1: Particle Size and Shape IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption IS 2386 Part 4: Mechanical Properties
Date of test	:	13-11-18

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 20MM DOWN COARSE AGGREGATE:

Total weight taken : 5000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	40 mm	0	0	0	100	100
2	20 mm	298	298	6.0	94.0	90-100
3	10 mm	2645	2943	58.9	41.1	25-55
4	4.75 mm	1811	4754	95.1	4.9	0-10
5	Pan	246	5000	100	0	–

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2018-12-27-128** **Date: 16-11-18**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	8.9	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	11.4	
3	Specific Gravity	2.62	_
4	Bulk Density(Loose) (Kg/l)	1.42	_
5	Bulk Density(Compacted) (Kg/l)	1.48	_
6	Water Absorption(%)	0.35	_
7	Aggregate crushing Value(%)	24.8	Max 30% for Aggregates to be used in concrete for wearing Surface, In case Aggregate Crushing Value Exceeds 30% then the test for ten percent fines should be conducted for Aggregates to be used in concrete other than for wearing Surface.
8	Aggregate Impact Value(%)	25.1	30% for Aggregates to be used in concrete for wearing Surface, 45% for Aggregates to be used in concrete other than for wearing Surface.

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Quality Manager

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Format No: CP/TF/01

TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2018-12-27-128** **Date: 16-11-18**

Customer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

Address : Byatarayanapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at Balaji Layout near Shobha Apartment near Railway Bridge in Ward no. 6, Byatarayanapura sub Division

Agency : V. Chandrappa, No.681, Dasarahalli, Bangalore - 24

Customer's Reference : BBMP/EE/BTP/WO/26/2016-17

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 13-11-18

Sample Type : Fine Aggregate

Reference to BIS codes : IS 383 : 2016 (Specification for Coarse and fine Aggregates)
IS: 2386 :1963(Part - 1, 3) RA2012
IS 2386 Part 1: Particle Size and Shape
IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption

Date of test : 13-11-18

Total weight taken : 1000 grams

Sl.no	Sieve Size	Weight Retained (gms)	Cumulative Weight Retained (gms)	% Cumulative Weight Retained	% Passing	Requirement as per IS 383:2016			
						Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
1	10 mm	0	0	0.0	100.0	100	100	100	100
2	4.75 mm	28	28	2.8	97.2	90-100	90-100	90-100	95-100
3	2.36 mm	179	207	20.7	79.3	60-95	75-100	85-100	95-100
4	1.18 mm	185	392	39.2	60.8	30-70	55-90	75-100	90-100
5	600 micron	214	606	60.6	39.4	15-34	35-59	60-79	80-100
6	300 micron	134	740	74.0	26.0	5-20	8-30	12-40	15-50
7	150 micron	177	917	91.7	8.3	0-10	0-10	0-10	0-15
8	Pan	83	1000	100.0	0.0	---	---	---	---
Result :The tested Sample Conforms to Grading Zone II									

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TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2018-12-27-128** **Date: 16-11-18**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS 383:2016
1	Water Absorption(%)	1.38	–
2	Specific Gravity	2.51	–
3	Material finer than 75 micron(%)	7.3	Uncrushed fine Aggregate Max 3%, Crushed Fine aggregate Max 15%, Mixed Fine aggregate Max 12%, Manufactured Fine aggregate Max 10%

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Format No: CP/TF/01

TEST REPORT ON PHYSICAL REQUIREMENTS OF SOLID CONCRETE BLOCKS

Lab ID	:	**CP-2018-12-27-128** **Date: 24-11-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balaji Layout near Shobha Apartment near Railway Bridge in Ward no. 6, Byatarayanapura sub Division
Agency	:	V. Chandrappa, No.681, Dasarahalli, Bangalore - 24
Customer's Reference	:	BBMP/EE/BTP/WO/26/2016-17
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	20-11-18
Sample Type/Size	:	Solid concrete blocks size (400X200X200)mm
Reference to BIS codes	:	IS : 2185 (Part 1) : 2005(RA 2010) Concrete Masonry Specification Part 1:Hollow and Solid Concrete Blocks (Dimensions -Annex-B, Clause 9.2 and 10 , Block density Annex -C Clause 9.3 and10, Compressive strength Annex -D Clause 9.4 and 10, Water absorption Annex -E Clause 9.5 and 10)
Date of test	:	21-11-18

BLOCK DENSITY:

Sl. No.	Measurement of overall Dimensions of Individual Blocks			Overall Volume of the Block in Cubic Centimetres	Weight of Oven Dried Block in Kilograms to the nearest 10 Gram	Block Density in Kg/cum*10^6	Avg.Block Density in (Kg/cum)	As per IS 2185(Part 1) :2005 (RA 2010)
	Length	Breadth	Height					
	mm	mm	mm	(Cm^3)	Kg	Kg/m^3	Kg/m^3	
1	400	202	203	16402	33.750	2057.6	2053.4	Not less than 1800Kg/m^3
2	400	201	201	16160	33.170	2052.5		
3	401	200	202	16200	33.210	2049.9		

WATER ABSORPTION:

Sl. No.	Wet weight after water absorption	Dry weight (Oven dry)	Water Absorption	Avg.Water Absorption	As per IS 2185(Part 1):2005 (RA 2010)
	kg	kg	%	%	
1	35.790	34.050	5.11	5.33	Shall not be more than 10% by mass
2	35.710	33.860	5.46		
3	35.720	33.880	5.43		

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b ID : **CP-2018-12-27-128** **Date: 24-11-18**

DIMENSION ANALYSIS

Sl.no	Length mm	Breadth mm	Height mm	Requirement as per IS 2185(Part 1):2005
1	402	201	201	Length : ± 5mm Breadth : ± 3mm Height : ± 3mm
2	401	203	203	
3	402	201	201	
4	403	203	200	
5	401	201	201	
6	403	203	203	
7	401	201	201	
8	402	203	203	
9	403	199	201	
10	401	202	202	
11	402	201	203	
12	401	203	201	
13	403	201	203	
14	401	202	201	
15	402	202	199	
16	403	201	202	
17	404	203	201	
18	402	201	203	
19	401	203	201	
20	403	200	201	
Average of 20	**402**	**202**	**202**	

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ID : CP-2018-12-27-128 Date: 24-11-18

COMPRESSIVE STRENGTH:

Sl. No.	Size of solid block		Area	Failure Load	Compressive strength	Average Compressive strength
	Length	Breadth				
	mm	mm	(mm^2)	(KN)	N/mm^2	(N/mm^2)
1	402	201	80802	352.3	4.4	4.4
2	401	203	81403	374.1	4.6	
3	402	201	80802	355.8	4.4	
4	403	203	81809	342.3	4.2	
5	401	201	80601	358.4	4.4	
6	403	203	81809	352.7	4.3	
7	401	201	80601	352.9	4.4	
8	402	203	81606	344.1	4.2	

As per IS Requirements (Table 2, Clause 5.1, 5.2 and 9.4)

Compressive strength		
Grade	Minimum average	Minimum Individual units.
C (5.0)	5.00 N/mm^2	4.00 N/mm^2
C (4.0)	4.00 N/mm^2	3.20 N/mm^2

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TEST RESULTS OF GRADATION FOR WBM

Lab ID	:	**CP-2018-12-27-128** **Date: 30-11-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balaji Layout near Shobha Apartment near Railway Bridge in Ward no. 6, Byatarayanapura sub Division
Agency	:	V. Chandrappa, No.681, Dasarahalli, Bangalore - 24
Customer Reference	:	BBMP/EE/BTP/WO/26/2016-17
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	28-11-18
Type of Mix	:	WBM (Water Bound Macadam)
Date of test	:	28-11-18

Grading for Coarse Aggregate

Oven Dry Weight : 5000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Spec.I.Vide Table 400.09 MORTH Specification
63	0	0	0.0	100.0	100
53	311	311	6.2	93.8	95-100
45	1089	1400	28.0	72.0	65-90
22.4	3292	4692	93.8	6.2	0-10
11.2	201	4893	97.9	2.1	0-5
Pan	107	5000	100.0	0.0	0

Grading for Screenings

Oven Dry Weight : 2000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Spec.I.Vide Table 400.10 MORTH Specification
11.2	0	0	0.0	100.0	100
9.5	128	128	6.4	93.6	80-100
5.6	831	959	48.0	52.1	50-70
0.18	585	1544	77.2	22.8	5-25
Pan	456	2000	100.0	0.0	0

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Lab ID	:	**CP-2018-12-27-128**	**Date: 30-11-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.	
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements to Roads and Drains at Balaji Layout near Shobha Apartment near Railway Bridge in Ward no. 6, Byatarayanapura sub Division	
Agency	:	V. Chandrappa, No.681, Dasarahalli, Bangalore - 24	
Customer Reference	:	BBMP/EE/BTP/WO/26/2016-17	
Source of Sample	:	Sample supplied by Agency	
Sample Condition	:	Satisfactory	
Date of Receipt	:	28-11-18	
Type of Mix	:	Coarse Aggregate for WBM (Water Bound Macadam)	
Date of test	:	28-11-18	

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	300.4	300.4
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	73.9	74.1
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	225.9	226.1
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.6	0.3
5	Aggregate impact value	(B/A)*100	24.6	24.7
6	Aggregate impact value (Mean of two tests)	Pecentage	24.6	

Note:-

The results pertain to the samples received and tested.
All information furnished by Customer/Representative
Any correction in the report will make this report invalid.
This report without prior written approval should not be reproduced or published in full or part.
Samples will be disposed after 90 days from the date of issue of test certificate

FOR CIVIL Pro.

R KARTHIK RECHAN
Authorized Signatory
Quality Manager

CIVIL PRO Sig..... Date..... BANGALORE

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರ
ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
ಬಿ.ಬಿ.ಎಂ.ಪಿ., ಬೆಂಗಳೂರು-24

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಬಿ.ಬಿ.ಎಂ.ಪಿ. ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ

End of Report

DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-2018-12-27-128** **Date: 30-11-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balaji Layout near Shobha Apartment near Railway Bridge in Ward no. 6, Byatarayanapura sub Division
Agency	:	V. Chandrappa, No.681, Dasarahalli, Bangalore - 24
Customer Reference	:	BBMP/EE/BTP/WO/26/2016-17
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	28-11-18
Type of Mix	:	Coarse Aggregate for WBM (Water Bound Macadam)
Date of test	:	28-11-18

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-08
Flakiness Index	12.8%	Combined Flakiness & Elongation Index for WBM is Maximum 35%
Elongation Index	12.9%	
Combined Flakiness and Elongation Index for WBM	25.7%	

Note:-
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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

CIVIL PRO Sig..... Date..... BANGALORE

End of Report